

1) $\sqrt[3]{44}$

$$\begin{array}{c} \wedge \\ 4 \ 11 \\ \wedge \\ 2 \ 2 \end{array}$$

$2\sqrt{11}$

2) $\sqrt[3]{6} \cdot 4\sqrt[3]{30}$

$$4\sqrt[3]{180} = 4 \cdot 2 \cdot 3\sqrt{5}$$

$$\begin{array}{c} \wedge \\ 6 \ 30 \\ \wedge \quad \wedge \\ 2 \ 3 \ 3 \ 10 \\ \quad \quad \wedge \\ \quad \quad 5 \ 2 \end{array}$$

$24\sqrt{5}$

3) $\sqrt[3]{\frac{32}{25}}$

$= \frac{\sqrt{32}}{\sqrt{25}} = \frac{4\sqrt{2}}{5}$

$\boxed{\frac{4\sqrt{2}}{5}}$

4) $\sqrt[3]{\frac{7}{3}} = \frac{\sqrt{7}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} =$

$\frac{\sqrt{21}}{3}$

5) $3\sqrt{3} - 4\sqrt{3}$

like $3x - 4x =$

$-1x$

$-1\sqrt{3}$

6) $2\sqrt[3]{6} - \sqrt[3]{5}$

can't simplify!

like $2x - y$

$2\sqrt{6} - \sqrt{5}$

7) $(4 - 3i) - (1 + 2i)$

$(4 - 1) + (-3i - 2i)$

$3 - 5i$

8) $(5 + \sqrt{3})(1 - \sqrt{2})$

$5 - 5\sqrt{2} + \sqrt{3} - \sqrt{6}$

9) $(1 - 4i)(5 - 3i)$

$5 - 3i - 20i + 12i^2$

$5 - 23i - 12$

$-7 - 23i$

10) $\frac{(1 - \sqrt{5})(2 + \sqrt{3})}{(2 - \sqrt{3})(2 + \sqrt{3})}$

$$\frac{2 + \sqrt{3} - 2\sqrt{5} - \sqrt{15}}{4 + 2\sqrt{3} - 2\sqrt{3} - 3}$$

$\frac{2 + \sqrt{3} - 2\sqrt{5} - \sqrt{15}}{1}$

11) $\frac{2 - 5i}{1 + 4i} \cdot \frac{1 - 4i}{1 - 4i}$

$$= \frac{2 - 8i - 5i + 20i^2}{1 - 4i + 4i - 16i^2}$$

$$= \frac{-18 - 13i}{17}$$

Rewrite in rational form

12) $(\sqrt[5]{6})^5$

$6^{5/5}$

6

Rewrite in radical form.

13) $10^{1/2}$

$\sqrt{10}$

14) $\sqrt[5]{64}$

$64^{1/5}$

$2\sqrt[5]{2}$

15) $(\sqrt[4]{81})^5$

$(3)^5 = 243$

$$16) 9^{-3/2}$$

$$\frac{1}{9^{3/2}} = \frac{1}{(\sqrt[2]{9})^3} = \frac{1}{3^3} = \frac{1}{27}$$

$$17) 2^{1/2} \cdot 2^{1/3}$$

$$2^{1/2 + 1/3} = 2^{5/6}$$

$$18) (5^{1/5})^4$$

$$5^{4/5}$$

$$19) \frac{1}{6^{-2/5}}$$

$$6^{2/5}$$

$$20) \left(\frac{10^6}{2^6}\right)^{1/2}$$

$$\left(\frac{10}{2}\right)^{6 \cdot 1/2} = \left(\frac{10}{2}\right)^3$$

$$= 5^3 = 125$$

$$21) (5^{3/8} \cdot 6^{1/2})^4$$

$$5^{3/2} \cdot 6^2$$

$$5^{3/2} \cdot 36$$

$$22) \frac{14^{6/5}}{14^{2/5}}$$

$$14^{6/5 - 2/5} = 14^{4/5}$$

$$23) \sqrt[3]{6} \cdot \sqrt[3]{9}$$

$$\sqrt[3]{6 \cdot 9} = \sqrt[3]{54} = 3\sqrt[3]{2}$$

$\begin{array}{c} \wedge \\ 6 \quad 9 \\ \wedge \quad \wedge \\ 3 \quad 2 \quad 3 \quad 3 \end{array}$

$$24) \frac{5}{\sqrt[4]{9}} \cdot \frac{\sqrt[4]{9}}{\sqrt[4]{9}} = \frac{5\sqrt[4]{9}}{3}$$

$$\begin{array}{c} \wedge \\ 3 \quad 3 \end{array}$$

$$25) \sqrt[3]{2} - 4\sqrt[3]{2}$$

$$\text{like } x - 4x = -3x$$

$$= -3\sqrt[3]{2}$$

$$26) 2x^{3/5} + 5x^{3/5}$$

$$7x^{3/5}$$

$$27) x^{1/3} \cdot x^{2/5}$$

$$x^{1/3 + 2/5} = x^{11/15}$$

$$28) \sqrt[3]{144x^9b^5}$$

$$\begin{array}{c} \wedge \\ 12 \quad 12 \\ \wedge \quad \wedge \\ 2 \quad 6 \quad 2 \quad 6 \\ \wedge \quad \wedge \\ 2 \quad 3 \quad 2 \quad 3 \end{array}$$

$$2x^3b\sqrt[3]{18b^2}$$

$$29) \sqrt[3]{\frac{x^{12}}{y^6}} = \frac{\sqrt[3]{x^{12}}}{\sqrt[3]{y^6}}$$

$$= \frac{x^4}{y^2}$$

$$30) (y^1 \cdot y^{2/3})^{1/6}$$

$$(y^{1 + 2/3})^{1/6}$$

$$(y^{5/3})^{1/6}$$

$$y^{5/18}$$